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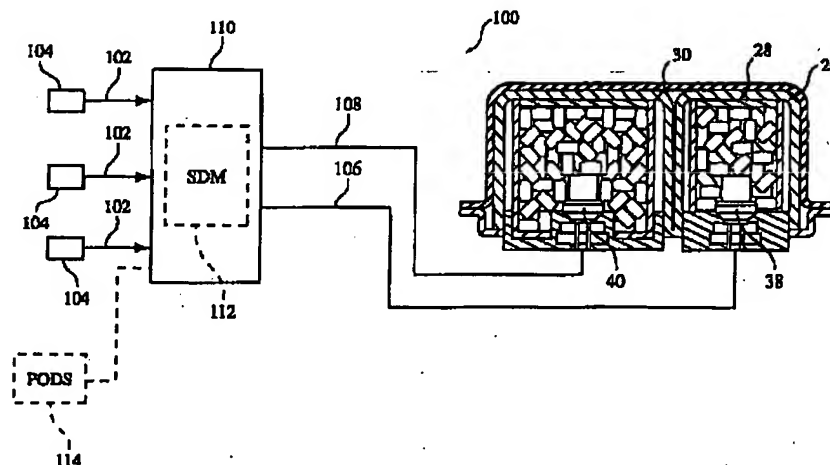
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(72) Inventors: **YOON, Joseph, Y.**; 3212 Lexham Lane, Rochester Hills, MI 48309 (US). **LITTLE, David, R.**; 5420 Princeton Place, Kokomo, IN 46902 (US).

(54) Title: **METHOD AND APPARATUS FOR DEPLOYMENT OF AN AIR BAG**



(57) Abstract: A method and apparatus for controlling the deployment of a passive inflatable restraint system wherein driver and passenger air bags are employed. Each air bag has two independently actuatable gas generators (28,30) which are activated in a fixed time sequence. The sequence is timed to provide an initial low inflation rate to just open the air bag container and initially deploy the air bag followed by a higher gas flow rate to complete filling of the airbag. In response to signals from vehicle acceleration sensors (104), an electronic control unit (110) determines if impact severity warrants deployment of the air bag. If deployment is required, the control unit (110) provides a first signal (106) for activating a first initiator (38) and a second signal (108) for activating a second initiator (40), the second signal being delayed a predetermined time after the first signals is generated. A passive occupant detection system (114) identifies infants and small children and instructs the control unit (110) to suppress deployment of the air bag.

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INTERNATIONAL SEARCH REPORT

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B. FIELDS SEARCHED

Electronic data bases consulted (Name of data base and where practicable terms used):

EAST

search terms: inflator, gas generator, dual stage, two stage, time delay, suppress, inhibit, deactivate, prevent, airbag, air bag, gas bag, sensor

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FIG. 12

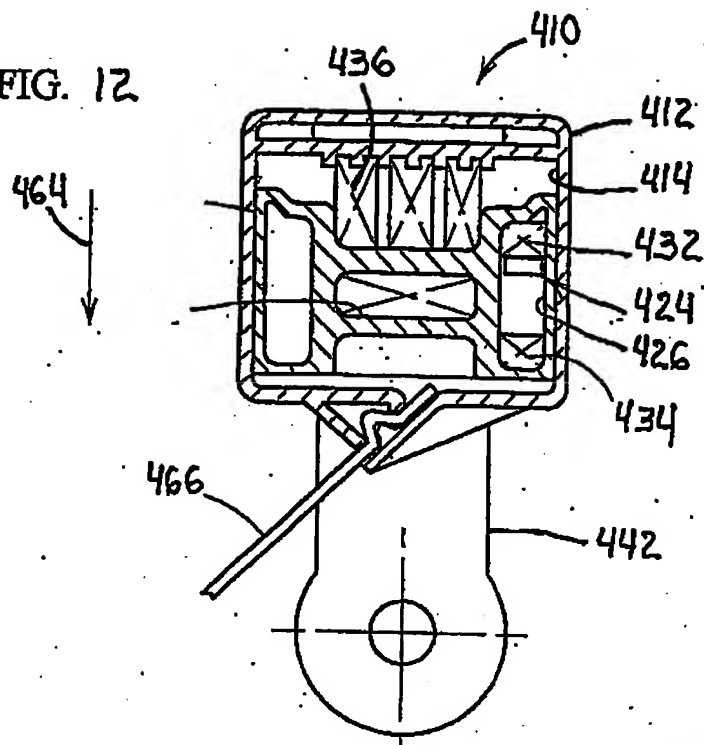
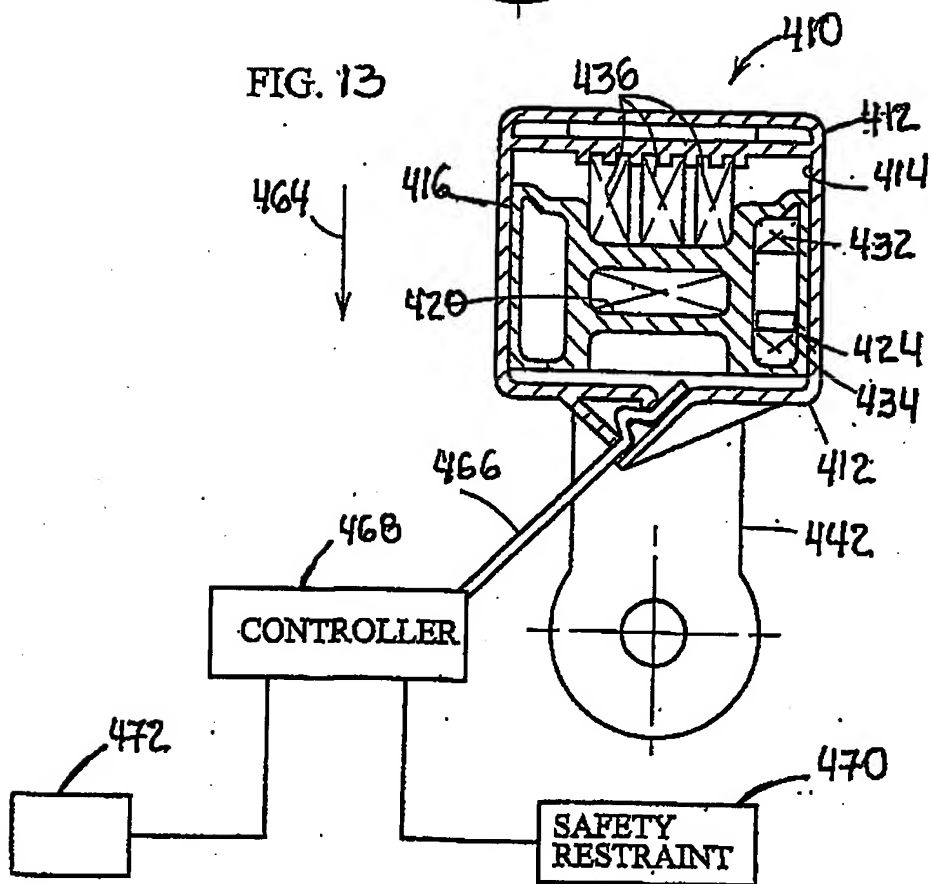


FIG. 13



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FIG. 14

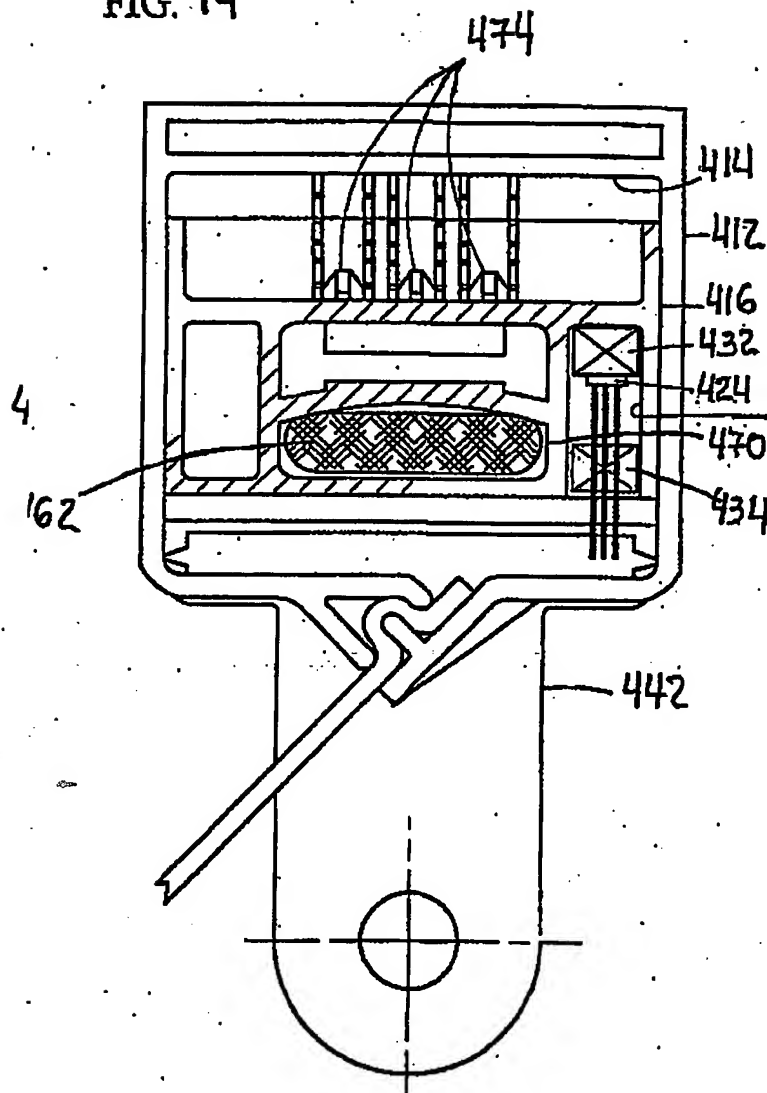
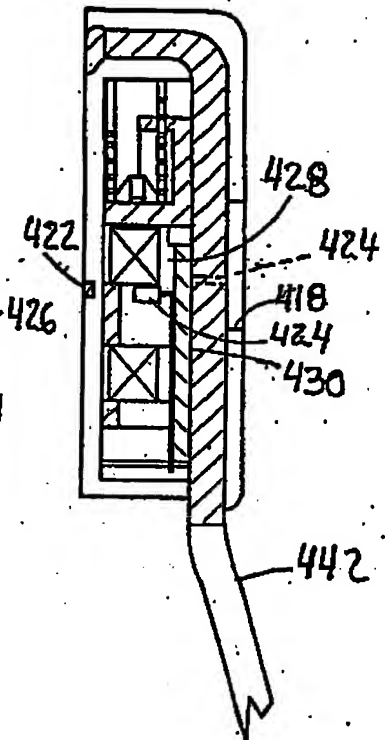
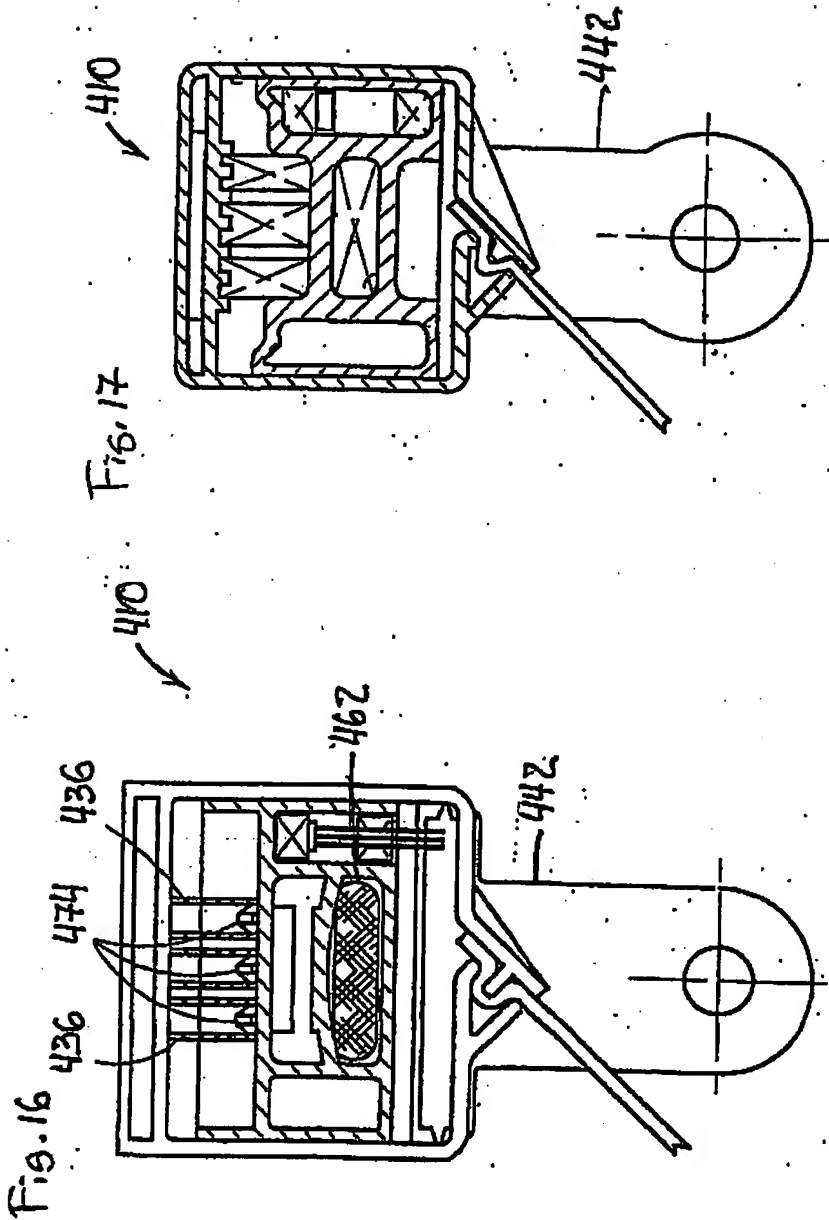


FIG. 15





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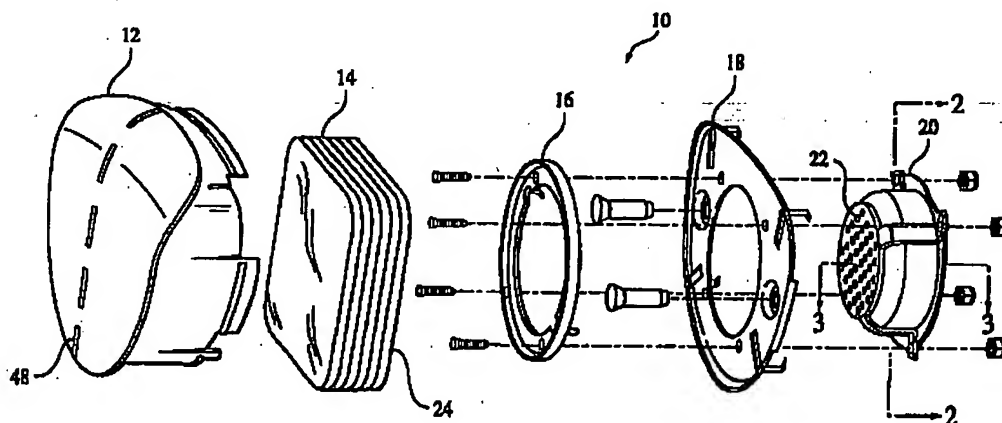
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(54) Title: METHOD AND APPARATUS FOR DEPLOYMENT OF AN AIR BAG



(57) Abstract: A method and apparatus for controlling the deployment of a passive inflatable restraint system wherein driver and passenger air bags are employed each having two independently actuable gas generators of the same or different sizes which are activated in a fixed time sequence. The sequence is timed to provide an initial low inflation rate to just open the airbag container and initially deploy the airbag followed by a higher gas flow rate to complete filling of the cushion. An electronic control unit containing a control algorithm and connected to external sensors monitors vehicle decelerations, detects impacts, and determines if impact severity warrants deployment of an airbag for occupant protection. The external sensors include one or more sensors located in the forward portion of the vehicle to provide early impact detection and crash severity indications; a weight based occupant detection system located in the passenger seat to identify infants and small children and provide airbag suppression; and a seat belt mode or seat belt tension sensor to determine the presence of a cinched child seat and provide additional airbag suppression. The control algorithm monitors the above described sensors and if a deployment is required, a signal for activating the first initiator are provided, the second signal being delayed a predetermined time after the first signal is generated.

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